FACULTY OF ENGINEERING

B. E. (Civil) III – Semester (CBCS) (Backlog) Examination, October 2021

Subject: Building Materials & Construction

Time: 2 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Define quarrying.

2. Compare brick work with stone work.

3. What are the constituents of lime stones?

4. What are the important properties of cement?

5. What are the uses of recycled materials?

6. What are the characteristics of good paints?

7. What are the different types of materials used in form work?

8. What are the different types of Scaffoldings?

9. What is a construction joint?

10. Define Creep.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) Explain any 5 characteristics of a good building stone.

    (b) Discuss the process of burning bricks in clamps with neat diagram.

12. (a) Explain the functions of cement ingredients.

    (b) Differentiate between Dry process and Wet process.

13. (a) Explain workability of concrete.

    (b) What are the smart building materials, how it can be used in construction?

14. (a) Explain the defects in plastering.

    (b) Explain the different types of varnishes.

15. (a) Explain the different types of form work.

    (b) Explain the different parts of Scaffoldings with neat sketch.

16. (a) What are the general causes of fire and how will we detect them?

    (b) What are the causes and effects of dampness?

17. (a) Explain any two types of Joints in concrete.

    (b) What are the causes and effects of cracks in buildings? Explain.

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FACULTY OF ENGINEERING
B.E. (EE/Inst.) III-Semester (CBCS)(Backlog) Examination, October 2021

Subject: Digital Electronics and Logic Design
Time: 2 hours   Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions.   **(5x2 = 10 Marks)**

1 Simplify the following expression using Boolean algebra
   $F(A, B, C) = \Sigma m(0, 1, 2, 3, 4, 5, 6, 7)$
2 State De Morgan's theorem.
3 What is noise immunity?
4 Compare the performance of TTL sub-families.
5 Subtract the binary number 00110111 from 10110001.
6 Represent the truth table of full subtractor.
7 Define synchronous sequential circuit.
8 What is ripple counter?
9 What is accuracy of a DAC?
10 List the drawbacks of R-2R ladder converter.

PART – B

Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Simplify the following Boolean expression using k map
   $Y(A, B, C, D) = \pi M(4, 5, 6, 7, 8, 12)+d(1, 2, 3, 9, 11, 14)$
   (b) Reduce the following expression to one literal
   $$\overline{A}B(\overline{D}+\overline{C}D)+B(A+\overline{A}CD)$$

12 Explain about the operation of
   (a) Resistor – Transistor of Logic
   (b) TTL with totem pole output

13 (a) Realize a 4-bit look-ahead-carry adder.
   (b) What is comparator?

14 (a) Implement a 4-bit ring counter.
   (b) Discuss the operation of a D-flip flop.

15 (a) Why are voltage DACs generally slower than current DACs?
   (b) With the help of neat diagram explain the working of flash-type ADC.

16 (a) Simplify and draw the logic diagram of the following expression
   $$(\overline{\overline{A}+\overline{\overline{A}+B}})(\overline{\overline{B}+\overline{\overline{B}+C}})$$
   (b) Discuss about decoder.

17 (a) Explain the operation of a basic latch circuit.
   (b) Describe the working of tracking type ADC.

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FACULTY OF ENGINEERING
B.E. (ECE) III-Semester (CBCS)(Backlog) Examination, October 2021

Subject: Network Analysis and Synthesis

Time: 2 hours   Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions.   **(5x2 = 10 Marks)**

1 Define propagation constant.
2 Draw the T and π network and write the conversion of a symmetric network.
3 What are limitation of constant k filters? How are the limitation overcome?
4 What is the criterion in choosing 'm' value in m-derived filter?
5 Check the positive realness of the function.
6 Write the two properties of R admittance function.
7 What is the Laplace transform of RC circuit?
8 Explain about pole and zero of a function.
9 Draw the bridge T Equalizer.
10 Define symmetrical T type attenuator.

PART – B

Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Obtain the expression for image impedance of asymmetrical L-network.
    (b) Calculate the image for iterative impedance of asymmetrical network with series impedance of 200 ohms and 400 ohms and 400 ohms and shunt impedance of 500 ohms.

12(a) Explain the frequency characteristic of Low, High, Band pass and Band elimination filter.
    (b) Design a constant K high – pass T section filter of Ro = 600 ohm fc =1 KHz.

13 Classify the equalizers. Give application and design steps of a equalizer.

14 (a) Define driving point impedance and admittance transfer impedance and admittance with examples.
    (b)List the properties of positive real functions with suitable case.

15 Synthesis LC immittance function in both the foster forms.
$$Z(s) = (s^2 + 2) (s^2 + 4) / s(s^2 + 3) (s^2 + 6)$$

….2

16 (a) Find the driving point input impedance. Plot the pole and zero of given network.
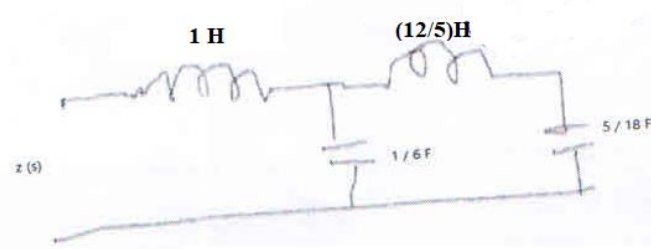
(b) Design a symmetrical T network attenuator with D = 40 dB and Ro = 600 ohm.

17 (a) Mention in brief the necessary condition for driving point function.

(b) Test whether the polynomial is Hurwitz or not
$$P(s) = s^4 + s^3 + 2s + 12$$

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FACULTY OF ENGINEERING
B.E. III - Semester (CBCS) (AE) (Backlog) Examination, October 2021

Subject: Fluid Mechanics & Machinery

Time: 2 Hours   **Max. Marks: 70**
(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 Define the following and write their units
   (a) Viscosity   (b) Surface Tension.
2 Write short note on Piezometer.
3 Differentiate Turbulent flow and Laminar flow.
4 What are various Minor Energy losses?
5 What is equipotential line?
6 What is draft tube?
7 Define the terms Hydraulic efficiency and write its formula.
8 Draw the inlet and out let velocity triangles for a Pelton Turbine and indicate the direction of velocities.
9 Define the Specific Speed of Pumps and write its formula.
10 Write the difference between the Turbines and Pumps.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) If the velocity distribution over a plate is given by u = (2/3)y-y². Where 'u' is the velocity in meters per second at a distance of 'y' meters above the plate, determine the Shear Stress at y=0, 0.1 and 0.2 meters take μ =6 poise.

   (b) Explain the phenomenon of Capillarity and derive an expression for capillary rise of a liquid.

12 Define the equation of continuity. Obtain an expression for Continuity Equation for a three dimensional flow.

13 (a) An oil of specific gravity and viscosity 0.06 poise is flowing through a pipe of diameter 200mm at the rate of 60liter/s. Find the head lost due to friction for a 500m length of pipe. Find the power required to maintain this flow.
   (b) Define the Hydraulic Gradient line.

14 (a) A Pelton wheel is having a mean bucket diameter of 1 meter and is running at 1000 rpm. The net head on the Pelton wheel is 700m. If the side clearance angle is 15°C and discharge through nozzle is 0.1m³/s find (i) Power available at the nozzle (ii) Hydraulic efficiency of the turbine.

15 A Centrifugal Pump is running at 100 rpm the outlet vane angle of the impeller is 30° and velocity of flow at outlet is 3m/s. The pump is working against a total head of 30m and the discharge through the pump is 0.3m³/s. If the manometric efficiency of the pump is 75%, determine (i) the diameter of the impeller, and (ii) the width of the impeller at outlet.

16 (a) A 30cmx15cm Venturmeter is inserted in inserted in a vertical pipe carrying water, flowing in the upward direction a differential mercury Manometer connected to the inlet and throat gives a reading of 20cm find the discharge. Take C_d=0.98.

 (b) How the viscosity depends upon temperature, explain in detail?

17 (a) A plate 0.025mm distant from a fixed plate, moves at 60cm/s and requires a force 20N per unit area i.e. 2N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.

 (b) Explain terms: Pipes in parallel, equivalent pipe.

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FACULTY OF ENGINEERING
B.E. III - Semester (CBCS) (IT) (Backlog) Examination, October 2021

Subject: Digital Electronics and Logic Design

Time: 2 Hours **Max. Marks: 70**
(Missing data, if any, may be suitably assumed)

PART – A
Note: Answer any five questions. **(5x2 = 10 Marks)**
1 Implement XOR gate using NAND gates.
2 Define synthesis and analysis of a logic functions.
3 Write VHDL code for full adder.
4 Differentiate PAL and PLA.
5 Draw basic SR latch using NOR gates.
6 Differentiate between synchronous and asynchronous counters.
7 List the elements of ASM chart and show their symbols.
8 Draw the state diagram of a 2-bit down counter.
9 Define clock skew and set up time.
10 What is an asynchronous sequential circuit? How the state transition takes place in these circuits?

PART – B
Note: Answer any four questions. **(4x15 = 60 Marks)**

11 (a) Obtain the minimal POS expression for the function
$f(a,b,c,d) = \pi M(3,11,14) + D (0,2,4)$. Realize using NOR gates.
   (b) With a neat diagram explain the features of FPGA.

12 (a) With a neat diagram explain the features of FPGA.
   (b) Draw the PLA and PAL structure for a full adder.

13 (a) Design a synchronous decade down counter using T flip-flops.
   (b) Write VHDL code for D flip-flop.

14 (a) Derive the state diagram for an FSM that has input 'w' and an output 'z'. The machine has to generate z=1 when the previous four values of 'w' were '1001' or '1111'. Otherwise, z=0. Overlapping input patterns are allowed.
   (b) Obtain a state diagram and state table for mealy type modulo-6 counter which counts the sequence 0,1,2,3,4,5,0,1,….. The counter counts the clock pulses if enable input w=1.

15 (a) Obtain a state diagram, flow table and state assignment table for a serial parity generator.
   (b) Derive a hazard-free minimum-cost implementation of the function
$f(A,B,C,D) = \sum m(0,4,11,13,15) + D(2,3,5,10)$.

..2..

16 (a) Use the tabular method to find a minimum cost SOP realization for the function
f(A,B,C,D)=∑(0,4,8,10,11,12,13,15).
(b) Implement a 16:1 multiplexer using 4:1 multiplexer.

17 Write short notes on
(a) Basic steps in the synthesis of asynchronous counter
(b) Conversion from JK FF to T FF
(c) Mealy FSM of a serial adder.

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FACULTY OF ENGINEERING

BE II/IV (ECE) I- Semester (Backlog) Examination, October 2021

Subject: Applied Mathematics

Time: 2 Hours

Max .Marks: 75

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any seven questions.   **(7x3=21 Marks)**

1 Obtain a partial differential equation by eliminating the arbitrary function f from $z = f(x^2 + y^2)$.

2 Solve $z(p-q) = z^2 + (x+y)^2$.

3 Show that the function $f(z) = iz - |z|^2$ is no where analytic.

4 Evaluate $\int_c x \, dz$ where c is the straight line path joining the points A$(1,1)$ and B$(3,2)$.

5 Find the residue of $f(z) = \left(\dfrac{z+2}{z-2}\right)^3$ at its pole .

6 Find the Taylor's series of $f(z) = \dfrac{1}{(3-z)^2}$ about $z = 2$.

7 Find the Lagrange interpolating polynomial which fits the following data:

x	-1	0	2
$f(x)$	5	3	5

8 If $y' = -4xy^2$, $y(1) = 1$ then evaluate $y(1.3)$ by using Euler's method with h $= 0.1$.

9 If 8x-10y+66=0 and 40x-8y=214 are the lines of regression of y on x and x on y respectively, then find the correlation coefficient between x and y.

10 Using the method of least squares, fit a straight line to the following data:

x	0	1	3	6	8
y	1	3	2	5	4

PART – B

Answer any three questions.   **(3x18=54 Marks)**

11 (a) Solve $(x^2 - y^2 - z^2)p + 2xy\, q = 2xz$.

    (b) Using Charpit's method, find the complete integral of $2(z + xp + yq) = yp^2$.

12 (a) Obtain Cauchy-Riemann equations in polar form.

    (b) Evaluate $\int_c \dfrac{e^{3z}}{(z-2)(z-4)} \, dz$ where c is the circle $|z| = 5$.

13 (a) Find the Laurent series of

$$f(z) = \frac{1}{(z+1)(z+3)} \text{ in the regions (i) } 1 < |z| < 3 \text{ and (ii) } |z| > 3.$$

(b) State Cauchy's residue theorem. Using it evaluate

$$\int_c \frac{(3z^2+2)}{(z-1)(z^2+9)} dz \text{ where } c \text{ is the circle } |z| = 4.$$

14 (a) Using Newton's backward interpolation formula, find $f(x)$ which fits the following data:

x	3	4	5	6
$f(x)$	6	24	60	120

(b) Evaluate $\Delta^4[(1-2x)(1-3x)(1-4x)(1-5x)]$ (with $h=1$).

15 (a) Fit a parabola $y = a + bx + cx^2$ to the following data:

x	1	2	3	4	5
y	12	31	60	99	148

(b) Find the rank correlation coefficient for the following data:

x	110	100	140	120	80	90
y	70	60	80	60	10	20

16 (a) Using Runge Kutta fourth order method, evaluate $y(1.1)$ if $y' = x^2 + y^2, y(1) = 2$ taking $h = 0.1$.

(b) Evaluate $\displaystyle\int_0^{2\pi} \frac{1}{(5-3\sin\theta)^2} d\theta$.

17 (a) Find the bilinear transformation which maps the points 0,-i,-1 onto the points i,1,0 respectively.

(b) Solve $y^2q^2 - xp + 1 = 0$.

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FACULTY OF ENGINEERING
B.E. 2/4 I-Semester (Backlog) Examination, October 2021

Subject: Mathematics – III (Common to All except I.T.)

Time : 2 Hours   **Max. Marks: 75**
(Missing data, if any, may be suitably assumed)

PART – A
Note : Answer any seven questions.   **(7 x 3 = 21 Marks)**

1 Find a partial differential equation by eliminating the arbitrary function f from
   $z = f\left(\dfrac{x}{y}\right)$.

2 Transform $z^2 = pqxy$ to $F(p, q) = 0$ form.

3 State Dirichlet's conditions.

4 Solve $u_x + u_y = 0$, $u(0, y) = 5e^{2y}$ by the method of separation of variables.

5 Define random variable, discrete random variable and continuous random variable.

6 The first four moments of a distribution about $x = 4$ are 1, 4, 10, 45. Find mean of the distribution.

7 If a random variable X follows a Poisson distribution such that $P(X = 1) = P(X = 2)$, find $P(X = 0)$.

8 Define hypothesis and null hypothesis.

9 Write the normal equations to fit a curve of the form $y = ax^2 + bx + c$ for the data (x_i, f_i), i = 1, 2, …., n.

10 The two regression line equations are $8x - 10y + 66 = 0$ and $40x - 18y = 214$ and variance of x is 9. Find the standard deviation of y.

PART – B
Note : Answer any three questions.   **(3 x 18 = 54 Marks)**

11 (a) Solve $(y + z)p + (x + z)q = x + y$.
   (b) Find the complete integral of the partial differential equation $px + qy = pq$.

12 Solve $\dfrac{\partial u}{\partial t} = \dfrac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(0,t) = u(1,t) = 0$ and $u(x,0) = 10$, $0 < x < 1,\ t > 0$.

13 (a) In a bolt factory, machines A, B, C manufacture 20%, 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probability that it is manufactured from machine A.
   (b) For the following probability distribution.

X	-3	-2	-1	0	1	2	3
P(X)	0.001	0.01	0.1	-	0.1	0.01	0.001

   find (i) missing probability (ii) E(X) and (iii) $E(X^2 + 2X + 3)$.

..2

14 (a) Find the variance of the normal distribution.

(b) A random sample of 10 bags of pesticide are taken whose weights are 50, 49, 52, 44, 45, 48, 46, 45, 49, 45 (in kgs). Test whether the average packing can be taken to be 50 kgs. (Given $t_{0.05}$ (9) = 2.262).

15 (a) Determine the constants a and b by the method of least squares such that $y = ae^{bx}$ fits the following data:

x	1.0	1.2	1.4	1.6
y	40.170	73.196	133.372	243.02

(b) Compute the rank correlation coefficient for the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

16 (a) Solve $p^2 - q^2 = x - y$.

(b) If θ is the acute angle between two regression lines, show that

$$\tan \theta = \frac{1-r^2}{r} \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}$$. Explain the significance when r = 0 and r = ±1.

17 Find the Fourier series $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$. Hence deduce that

$$1 + \frac{1}{3^2} + \frac{1}{5^2} + ... = \frac{\pi^2}{8}.$$

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FACULTY OF ENGINEERING
B.E. 2/4 I - Semester (IT) (Backlog) Examination, October 2021

Subject: Discrete Mathematics

Time: 2 Hours   **Max. Marks: 75**
(Missing data, if any, may be suitably assumed)

PART – A
Answer any seven questions.   **(7x3=21 Marks)**

1   Write truth table for the disjunction of TWO propositions.
2   Symbolizethe statement and negate it "He likes mathematics and h does not like science.
3   Write ASSOCITIVE Laws.
4   Prove that for all integers $n \geq 4, 3^n > n^3$ by induction.
5   Define ANTISYMMETRIC property of arelation.
6   How many ways are there to roll 2 dice to yield a sum that is Divisible by 3.
7   What is directed graph?
8   Define (a) Cycle graph   (b) Bipartite graph.
9   What are the three types of true traversals?
10 Define PRODUCT-OF SUMS expansion.

PART – B
Answer any three questions.   **(3x18=54 Marks)**
11 Construct a TRUTH TABLE of the following compound propositions
     (a) $p \vee 7p$ (b) $p \oplus 7p$ (c) $7p \leftrightarrow q$ (d) $(p \vee q) \wedge r$ (e) $7p \rightarrow (q \rightarrow r)$

12 (a) Demonstrate that 'S' is a valid inference from the premises
          $P \rightarrow \sim Q,\ Q \vee R,\ \sim S \rightarrow P\ and\ \sim R.$
     (b) How many 4-digit number can be formed with ten – digits (0,1,2, …,9) if
          (i) Repetitions are allowed   (ii) Repetitions are not allowed.

13 (a) Define RECURRENCE RELATION.
     (b) Explain briefly about conditional probability.

14 (a) Draw the Hasse diagram for divisibility on the set {1,2,3,5,7,11,13} is it a Lattice.
     (b) Define Euler circuit and Euler path. Find which of the following graph have Euler circuit or Euler path or not having both
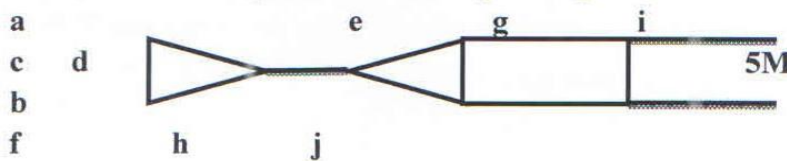
                                                                                    ..2..
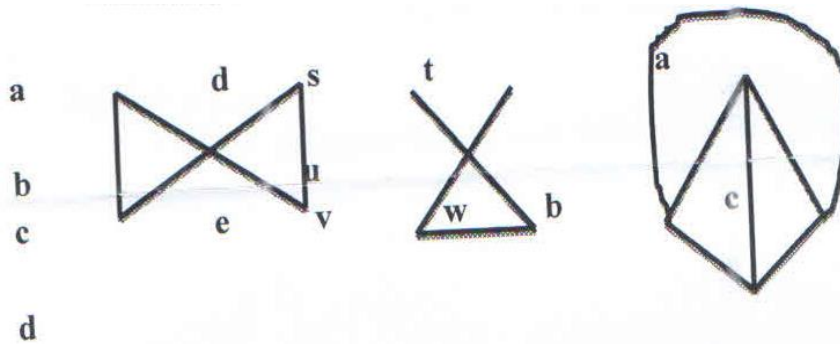
15 Consider the following relations on the set {1,2,3,4} decide whether it is RELEXIVE
   (a) {(2,2), (2,3,) (2,4), (3,2), (3,3), (3,4)}   (b) {(1M1), (1,2), (2,1), (2,2), (3,3), (4,4)}
   (c) {(2,4,), (4,0)}   (d) {(1,2,), (2,3,), (3,4)}   (d) {(1,2), (2,3), (3,4)}
   (e) {(1,1), (2,2), (3,3), (4,4)}   (f) {!,3), (1,4), (2,3), (2,4), (3,1), (3,4)}.

16 (a) Use DFS algorithm to find spanning tree for the following graph

5M

   (b) Describe Kruskal's algorithm for a minimal spanning tree with example.

17 Explain briefly about Hamilton path and Euler circuits.

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FACULTY OF ENGINEERING
B.E. III - Semester (ECE/M/P/AE/IT) (AICTE) (Backlog) Examination, October 2021

Subject: Effective Technical Com. in English

Time: 2 Hours   **Max. Marks: 70**
(Missing data, if any, may be suitably assumed)

PART – A
Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 What is ABC of Technical Communication?
2 Why does technical writing demand factual use of language?
3 What is IOM? How is technical writing different from novel, poetry etc.?
4 Why is the subject line important in an e-mail?
5 How is the option CC useful in e-mail? Discuss the importance of appendix in a report.
6 What information does the Abstract of a technical report present?
7 What is an operations manual?
8 Mention any one of the prominent uses of a user manual.
9 What is a Pie chart ideally suited for?
10 Mention any one rule of thumb when creating an effective presentation.

PART – B
Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) What is the significance of technical communication? Elucidate the essential features of technical communication.
(b) Compare between technical and general writing.

12 (a) "E-mail etiquettes are essential in writing effective e-mail messages" Discuss.
(b) Write a letter to the Regional Road Transport Authority of your region complaining about lack of adequate bus services in your locality. Request them to increase the frequency and number of buses.

13 (a) Discuss various types of reports and their purposes.
(b) As the sales manager of Fantasy Garments, a readymade clothes company, prepare a report on the set-up of the new showroom at Vijayawada for all age groups ranging from formals to casuals.

14 (a) Compare the function and utility of various types of manuals. What is a an operations manual? How is it useful?
(b) Draft a user guide about the specifications, uses and features of a Mobile phone.

15 (a) Discuss various advantages of non-verbal/graphical representation of information with suitable examples.

   (b) Look at the following graph. It shows the result of S.S.C Exam of The General English High School. Write a paragraph giving all the information of S.S.C. Results.
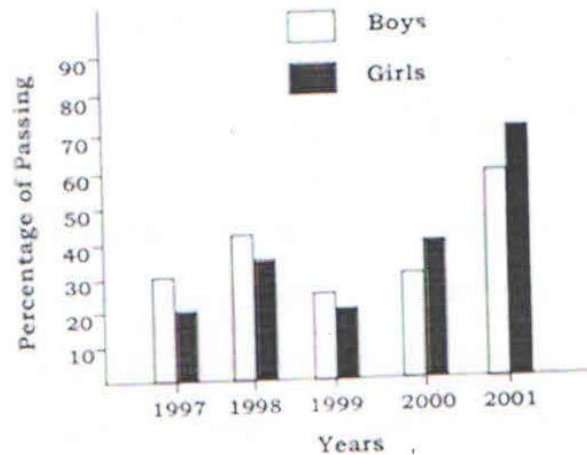
16 (a) Discuss briefly the aspects that make a visual presentation effective.

   (b) Transfer the following text into a logic tree. All living things have four basic life processes.

The first one is nutrition which is of three types-simple diffusion, autotrophic nutrition and heterotrophic nutrition. Simple diffusion takes place in microorganisms. Autotrophic nutrition occurs in plants and the heterotrophic nutrition in animals. The second life process is respiration. There are two types of respiration: aerobic and anaerobic. The next life process is transportation of materials throughout the body of the living organism. The final life process is excretion.

17 (a) What are the essential parts of a Business proposal.

   (b) Write a few tips for preparing an effective oral presentation. Give a checklist of making a winning presentation.

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FACULTY OF ENGINEERING
B.E. III - Semester (CE/EE/EIE/CSE) (AICTE) (Backlog) Examination, October 2021

Subject: Essence of Indian Traditional Knowledge

Time: 2 Hours　　　　　　　　　　　　　　　　　　　**Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.　　　　　　　　　**(5x2 = 10 Marks)**

1　Define philosophy. And its nature.
2　What is civilization?
3　Explain the concept of Upanishads.
4　What is religion? Explain.
5　Write a note on schools of Vedanta.
6　Explain the concept of Indian painting.
7　What are the development of science in ancient India?
8　Explain about education on the lines of Buddhism.
9　What is Satyagraha?
10　Write a note on Science and Technology in India.

PART – B

Note: Answer any four questions.　　　　　　　　　**(4x15 = 60 Marks)**

11 (a) Explain the general characteristics of culture.
　 (b) What are the importance of culture in human literature?

12 (a) Explain the literature of south India.
　 (b) Write short notes on Vedas.

13 (a) Explain the chief characteristics of Religion.
　 (b) Explain the Buddhist concept of Ashtanga Marga.

14 (a) Brief discuss some of Jyotiba Phule's writings.
　 (b) Dayananda Saraswati was a "Social reformer"- Comment.

15 (a) Discuss the relation between Religion and Philosophy.
　 (b) Given an account of Gandhiji's concept of "None-violence".

16 (a) Explain the concept of value based education.
　 (b) Write an essay on social change-role of Technology.

17 (a) What about the Dance and Drama?
　 (b) What are the role Gurukulas in education system?

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